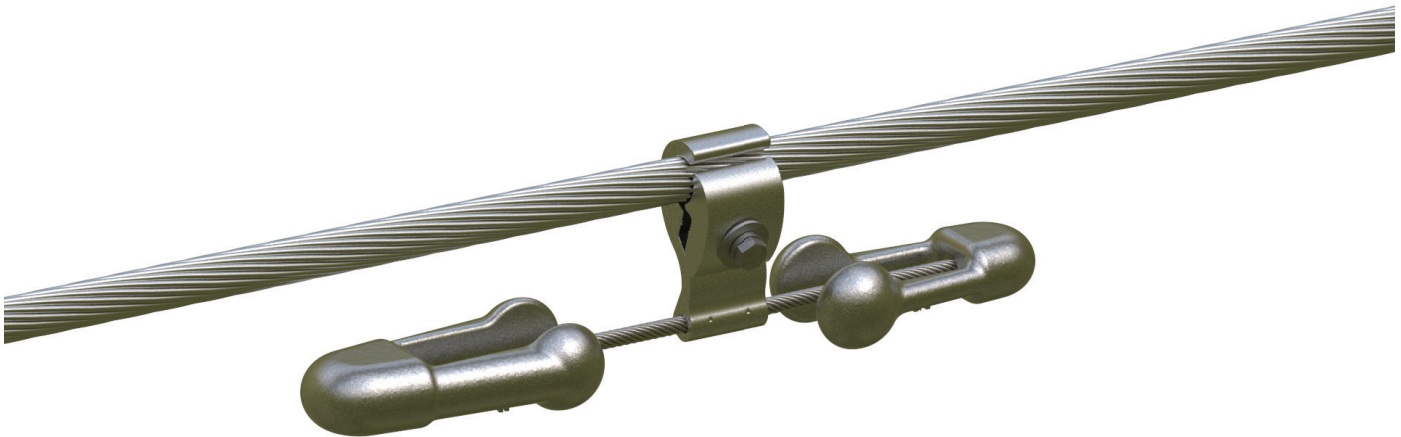




VORTX™ VIBRATION DAMPER

The **VORTX Vibration Damper** responds to wind-induced line vibration that is characterized by high-frequency, low amplitude motion commonly known as aeolian vibration. The large and small weights of the VORTX dampers can achieve greater power dissipation and frequency response performance than "symmetrical weight" Stockbridge damper designs. Wider frequency coverage translates into better span protection as energy is more effectively dissipated over the entire range of span natural frequencies.

FEATURES AND BENEFITS

- Extruded aluminum alloy contoured clamp offers a precision fit to evenly capture the cable and uniformly distribute pressure along its surface
- Meets IEC 61897 and IEEE 664 requirements for Stockbridge dampers
- Precision-manufactured galvanized steel messenger strand efficiently dissipates vibration energy
- Galvanized ductile iron weights
- Dampers can be ordered with a breakaway bolt head designed to shear off when the bolt is tightened to the proper torque value
- Number and placement of dampers in each span is determined by a proprietary, internally-developed online program that utilizes the results of ongoing field and laboratory research
- EHV VORTX Dampers are available for 500 kV applications

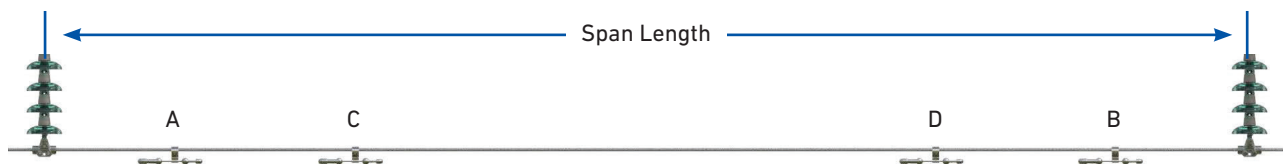
DAMPER SELECTION

Cable Diameter	Damper Type
$\leq 0.75"$ (19 mm)	Spiral Vibration Damper
$> 0.75"$ (19 mm)	VORTX Vibration Damper

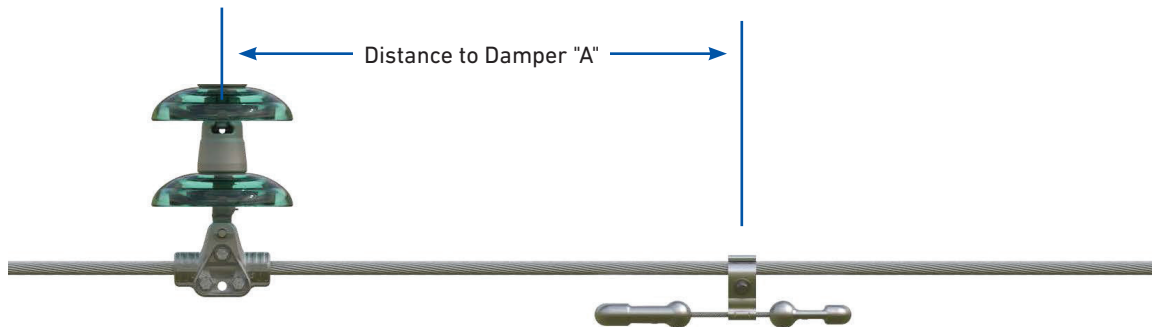
DAMPER QUANTITY & PLACEMENT

- The number of dampers required per span is dependent upon wind energy exposure and the cable's self-damping characteristics
- Longer spans, such as river crossings, need additional protection and may require more than one damper within the span, including dampers that are placed midspan
- Dampers can be installed directly onto ACSR, AAC, AAAC, and ACAR conductors, but cannot be installed directly onto composite core HTLS conductors and must be secured to the protective rods of the attachment hardware or PLP Protector Rods (ordered separately) that are installed on the conductor. Installing VORTX Dampers on suspension rods or Protector Rods is recommended for ACSS, but does not require it.

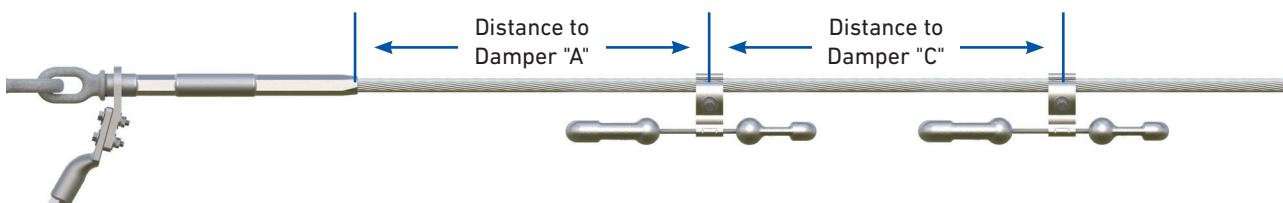
General Placement Sequence



Damper Placement at Tangent Hardware Locations



Damper Placement at Dead-End Hardware Locations

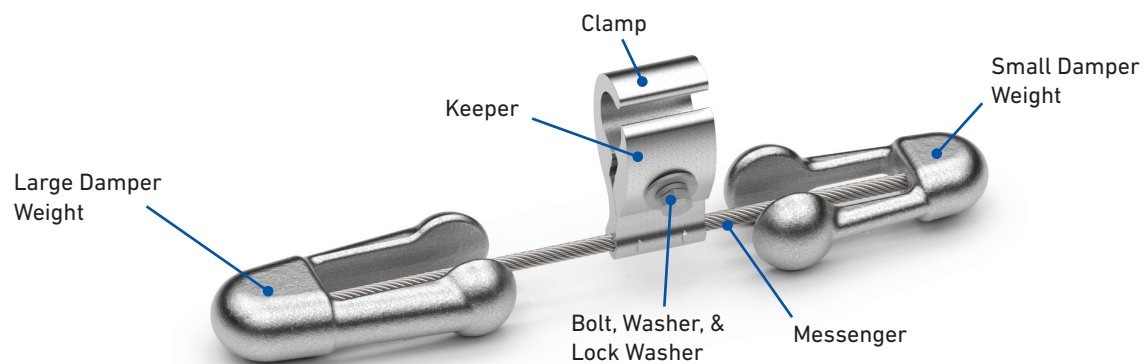




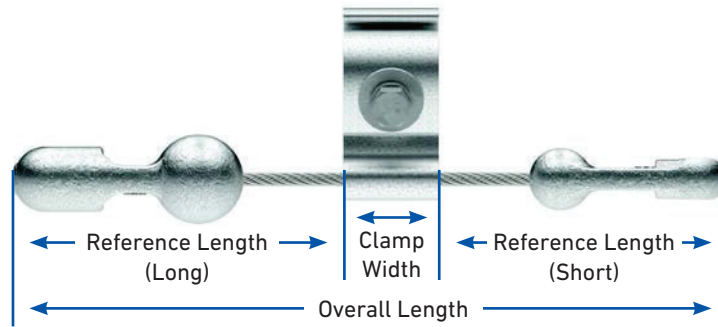
VORTX DAMPER PLACEMENT SOFTWARE

- Based upon PLP's 70+ year knowledge base on vibration to determine the recommended damper model, quantity, and optimal placement location
- Considers many input variables specific to the individual cable, such as its construction, design, and local operating conditions
- Sign up at plpvortex.com at no charge to PLP customers. Contact your local representative or PLP Technical Support for more information.

COMPONENTS



DIMENSIONS



VORTX Vibration Damper Dimensions

Catalog Number	Clamp Range		Overall Length		Reference Length (Long)		Reference Length (Short)		Clamp Width		Bolt Size	Assembled Weight	
	in	mm	in	mm	in	mm	in	mm	in	mm	mm	lb	kg
VSD-2016	0.483 - 0.611	12.3 - 15.4	14.6	370	6.9	175	6.0	153	1.63	41.1	M12 x 50	3.6	1.6
VSD-2020	0.612 - 0.785	15.5 - 19.9	14.9	379	6.9	175	6.0	153	2.00	50.8	M12 x 50	3.9	1.8
VSD-2025	0.786 - 0.982	20.0 - 24.9	14.9	379	6.9	175	6.0	153	2.00	50.8	M12 x 50	4.0	1.8
VSD-2032	0.983 - 1.260	25.0 - 31.9	15.1	384	6.9	175	6.0	153	2.20	55.9	M12 x 70	4.4	2.0
VSD-2040	1.261 - 1.578	32.0 - 40.0	15.3	389	6.9	175	6.0	153	2.38	60.5	M12 x 70	4.6	2.1
VSD-2050	1.579 - 1.970	40.1 - 50.0	15.4	392	6.9	175	6.0	153	2.50	63.5	M12 x 70	4.9	2.2
VSD-2520	0.612 - 0.785	15.5 - 19.9	12.7	322	6.4	161	4.3	110	2.00	50.8	M12 x 50	4.9	2.2
VSD-2525	0.786 - 0.982	20.0 - 24.9	12.7	322	6.4	161	4.3	110	2.00	50.8	M12 x 50	5.0	2.3
VSD-2532	0.983 - 1.260	25.0 - 31.9	12.9	327	6.4	161	4.3	110	2.20	55.9	M12 x 70	5.4	2.5
VSD-2540	1.261 - 1.579	32.0 - 40.0	13.1	332	6.4	161	4.3	110	2.38	60.5	M12 x 70	5.7	2.6
VSD-3525	0.786 - 0.982	40.1 - 50.0	14.7	374	7.0	179	5.7	145	2.00	50.8	M12 x 50	7.3	3.3
VSD-3532	0.983 - 1.260	24.9 - 31.9	14.9	379	7.0	179	5.7	145	2.20	55.9	M12 x 70	7.7	3.5
VSD-3540	1.261 - 1.578	32.0 - 40.0	15.1	384	7.0	179	5.7	145	2.38	60.5	M12 x 70	7.9	3.6
VSD-3550	1.579 - 1.970	40.1 - 50.0	15.2	387	7.0	179	5.7	145	2.50	63.5	M12 x 70	8.2	3.7
VSD-4032	0.983 - 1.260	25.0 - 31.9	20.3	515	10.5	267	5.7	145	2.20	55.9	M12 x 70	10.8	4.9
VSD-4040	1.261 - 1.578	32.0 - 40.0	20.4	519	10.5	267	5.7	145	2.38	60.5	M12 x 70	11.1	5.0
VSD-4050	1.579 - 1.970	40.1 - 50.0	20.6	523	10.5	267	5.7	145	2.50	63.5	M12 x 70	11.4	5.2
VSD-4061	1.971 - 2.422	50.1 - 61.5	21.1	535	10.5	267	5.7	145	3.00	76.2	M12 x 75	12.1	5.5
VSD-5240	1.261 - 1.578	32.0 - 40.0	23.9	606	12.1	307	5.7	145	2.38	60.5	M12 x 75	13.5	6.1
VSD-5250	1.579 - 1.970	40.1 - 50.0	24.0	609	12.1	307	5.7	145	2.50	63.5	M12 x 75	13.8	6.3
VSD-5261	1.971 - 2.422	50.1 - 61.5	24.5	622	12.1	307	5.7	145	3.00	76.2	M12 x 75	14.5	6.6
VSD-5543EHV	1.500 - 1.700	38.1 - 43.2	19.4	493	10.1	257	6.8	173	2.63	66.8	M12 x 50	18.3	8.3
VSD-5549EHV	1.701 - 1.950	43.2 - 49.5	21.8	552	11.3	286	7.8	197	2.75	69.9	M12 x 50	18.5	8.4
VSD-5561EHV	1.951 - 2.422	49.5 - 61.5	21.8	553	11.1	291	7.6	193	3.13	79.4	M12 x 100	18.5	8.4



ORDERING INFORMATION

- Complete the catalog number by selecting the appropriate suffix codes from the tables below
- In order to select the proper clamp suffix code, use the following equation to determine the overall diameter for the section of the span on which the damper will be installed: **Cable Diameter + (2 x Protector Rod Diameter)**
- For twin bundle 500 kV applications, please reference the EHV VORTX Vibration Damper section

VORTX Vibration Damper Catalog Number

VSD- X X X
(Section 1) (Section 2) (Section 3)

Catalog Number Example: VSD-4050B

Includes (1) VORTX Vibration Damper with weights for cable diameter range 0.984" - 1.345", clamp for overall diameter range 1.579" - 1.970", and Break-away Bolt

Section 1

Weight Suffix Code	ACSR, AAC, AAAC, and ACAR Diameter Range		Galvanized Steel and Aluminum-Clad Diameter Range		OPGW Diameter Range	
	in	mm	in	mm	in	mm
20	0.473 - 0.720	12.0 - 18.2	0.401 - 0.486	10.2 - 12.3	0.465 - 0.720	11.8 - 18.2
25	0.721 - 0.858	18.3 - 21.8	0.487 - 0.650	12.4 - 16.5	0.612 - 1.260	15.5 - 32.0
35	0.859 - 0.983	21.9 - 24.9	-	-	0.721 - 1.260	18.3 - 32.0
40	0.984 - 1.345	25.0 - 33.9				
52	1.346 - 1.602	32.1 - 40.7				

Section 2

Clamp Suffix Code	Clamp Range	
	in	mm
16	0.483 - 0.612	12.3 - 15.5
20	0.612 - 0.786	15.5 - 20.0
25	0.786 - 0.983	20.0 - 25.0
32	0.983 - 1.261	25.0 - 32.0
40	1.261 - 1.579	32.0 - 40.1
50	1.579 - 1.970	40.1 - 50.0
61	1.970 - 2.422	50.0 - 61.5

Section 3

Bolt Suffix Code	Bolt Type
Leave Blank	Standard
B	Break-away

ORDERING INFORMATION

VORTX Vibration Dampers for EHV

- EHV dampers are specially designed to meet the higher electrical corona/RIV noise requirements at voltages of 500 kV and higher. The EHV damper utilizes special weight and clamp designs to meet these requirements.
- Complete the catalog number by selecting the appropriate suffix codes from the tables below
- In order to select the proper clamp suffix code, use the following equation to determine the overall diameter for the selection of the span on which the diameter will be installed: **Cable Diameter + (2 x Protector Rod Diameter)**

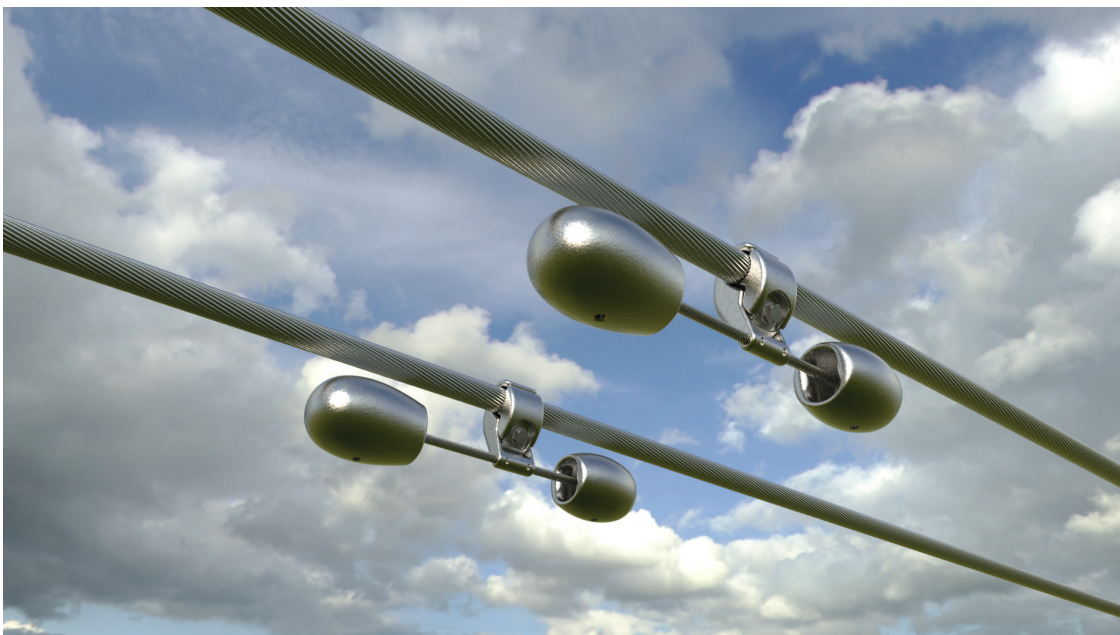
VORTX Vibration Damper for EHV Catalog Number

VSD- X X X
(Section 1) (Section 2) (Section 3)

Catalog Number Example: VSD-5561EHVB

Includes (1) EHV VORTX Vibration Damper with weights for cable diameter range 1.602" - 1.929", clamp for overall diameter range 1.951" - 2.422", and Break-away Bolt

Section 1			Section 2			Section 3	
Weight Suffix Code	ACSR, AAC, AAAC, and ACAR Diameter Range		Clamp Suffix Code	Clamp Range		Bolt Suffix Code	Bolt Type
	in	mm		in	mm		
55	1.602 - 1.929	40.7 - 49.0	43EHV	1.500 - 1.700	38.1 - 43.2	Leave Blank	Standard
			49EHV	1.700 - 1.950	43.2 - 49.5		
			61EHV	1.951 - 2.422	49.5 - 61.5	B	Break-away

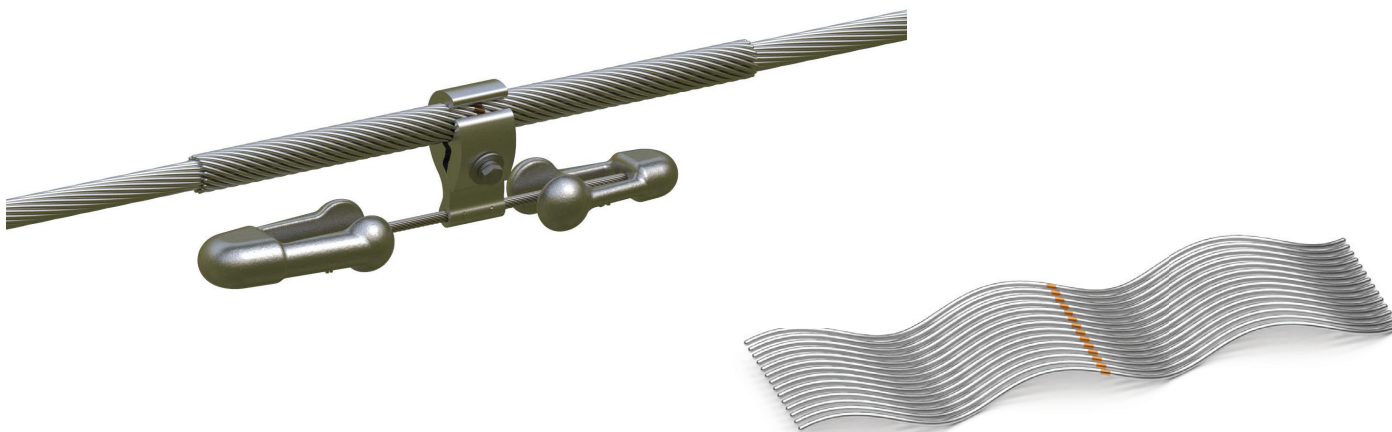


ORDERING INFORMATION

Protector Rods

- Must be ordered for locations that require the damper to be placed beyond the protective rods of the attachment hardware on composite core HTLS conductors. Protector rods are optional but recommended on ACSS.
- Select the appropriate catalog number from the table below using the cable diameter
- For EHV applications, add "E" to the end of the part number (**EXAMPLE:** PR-0156E)

Catalog Number	Cable Diameter		Rod Length		Rod Diameter		Rods per Set	Color Code	Units per Carton	Weights per Carton	
	in	mm	in	mm	in	mm				lb	kg
PR-0135	0.378 - 0.423	9.6 - 10.7	12	304	0.121	3.1	11	Yellow	50	10	4.5
PR-0137	0.424 - 0.475	10.8 - 12.1	12	304	0.121	3.1	12	Brown	50	10	4.5
PR-0139	0.476 - 0.533	12.1 - 13.5	16	406	0.121	3.1	13	Blue	50	14	6.4
PR-0141	0.534 - 0.585	13.6 - 14.8	16	406	0.121	3.1	14	Green	50	14	6.4
PR-0142	0.586 - 0.618	14.9 - 15.6	16	406	0.146	3.7	13	Orange	50	21	9.5
PR-0144	0.619 - 0.667	15.7 - 16.9	16	406	0.146	3.7	14	Purple	50	21	9.5
PR-0146	0.668 - 0.722	17.0 - 18.3	20	508	0.146	3.7	15	Red	50	29	13.1
PR-0148	0.723 - 0.816	18.4 - 20.3	20	508	0.146	3.7	16	Black	50	29	13.1
PR-0150	0.817 - 0.898	20.8 - 22.7	20	508	0.146	3.7	17	White	50	31	14.1
PR-0151	0.899 - 0.954	22.8 - 24.2	24	610	0.167	4.2	17	Yellow	50	47	21.3
PR-0152	0.955 - 1.019	24.3 - 25.8	24	610	0.182	4.6	16	Brown	25	29	13.1
PR-0152E	0.955 - 1.019	24.3 - 25.8	24	610	0.250		16	Brown	25	29	13.1
PR-0154	1.020 - 1.064	25.9 - 27.0	24	610	0.182	4.6	17	Blue	25	29	16.1
PR-0155	1.065 - 1.098	27.1 - 27.8	26	660	0.204	5.2	16	Green	25	36	16.3
PR-0156	1.099 - 1.181	27.9 - 29.9	26	660	0.250	6.4	14	Orange	25	48	21.7
PR-0158	1.182 - 1.298	30.0 - 32.9	26	660	0.250	6.4	15	Purple	25	51	23.1
PR-0160	1.299 - 1.415	33.0 - 35.9	26	660	0.250	6.4	16	Blue	20	44	19.9
PR-0162	1.416 - 1.543	36.0 - 39.2	26	660	0.250	6.4	17	Yellow	20	48	21.7
PR-0163	1.544 - 1.685	39.2 - 42.8	26	660	0.250	6.4	19	Brown	15	40	18.1
PR-0164	1.686 - 1.840	42.8 - 46.7	26	660	0.250	6.4	20	Blue	15	42	19.0



Set of Protector Rods

